

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/20/2012 has been entered.
2. It is noted that claims 15 and 20-35 are pending. Further, it is noted that the prior art references of record remain relevant against the present claims.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the fourth paragraph of 35 U.S.C. 112:

Subject to the [fifth paragraph of 35 U.S.C. 112], a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers.

4. Claim 35 is rejected under 35 U.S.C. 112, 4th paragraph, as being of improper dependent form for failing to further limit the subject matter of the claim upon which it depends, or for failing to include all the limitations of the claim upon which it depends.

Claim 35 recites that the polyamide is a (co)polyamide. However, (co)polyamide encompasses both a polyamide and a co-polyamide, i.e. a polyamide copolymer. To that end attention is directed to claim 15 from which claim 35 depends and which recites that the thermoplastic matrix is a polyamide. Thus, given that the terms (co)polyamide encompasses

both polyamide and copolymers thereof and given that claim 15 recites polyamide, it is unclear how the recitation of a co-polyamide in claim 35 further limits the subject matter of parent claim. Accordingly, the requirements of 35 U.S.C. 112 fourth paragraph have not been met.

Applicant may cancel the claim(s), amend the claim(s) to place the claim(s) in proper dependent form, rewrite the claim(s) in independent form, or present a sufficient showing that the dependent claim(s) complies with the statutory requirements.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 15, 20-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hoerold et al (US 2004/0049063).

Regarding claim 15, Hoerold et al discloses a composition comprising a thermoplastic matrix, i.e. polymer and a combination of the flame retardants (Abstract, Page 1 [0008]-[0016], Page 2 [0034]-[0035]). Specifically, the reference discloses the use of polyamides such as glass fiber reinforced, polyamide 6,6 (Table 3) which is utilized in combination with a combination of flame retardants, i.e. a flame-retardant system.

The reference discloses the use of phosphinic salts disclosed as Formula I in the reference (Abstract, Page 1 [0008]-[0016]). It is noted that the phosphinic compounds of Formula I correspond to compound F1 recited in the present claims. Specifically, reference discloses that R_1 and R_2 are identical or different and are C_{1-6} alkyl, linear or branched and/or aryl, m , (recited as "z" in the present claims) is 1-4 which overlaps the values of 2 or 3 and M is calcium, magnesium, aluminum or zinc, identical to that presently claimed (Abstract, Page 1 [0008]-[0016]).

The reference discloses the use of reaction products between phosphoric acid and melamine, i.e. melamine polyphosphate (Page 2 [0034]). It is noted that this compound corresponds to compound F2 recited in the present claims.

Further, the reference discloses the use of melamine condensation derivatives such as melam, melon, and melem, i.e. nitrogen containing compounds (Page 2 [0035]). It is noted that this compound corresponds to compound F3 recited in the present claims.

With respect to the amounts of F1, F2 and F3 as well as combinations of F1+F2 and F1+F2+F3 recited in the present claims, the reference discloses the following:

- i. The phosphinic acid compounds (F1) comprise 1 to 30 wt % of the composition which overlaps the amount of 5 to 15 wt % recited in the present claims.
- ii. Compounds such as melamine polyphosphate (F2) comprise 5 wt % of the composition (Table 1) which is which is within the range of 2 to 10 wt % recited in present claims.
- iii. Compounds such as melam (F3) are utilized in amount from 0.1 to 10 wt % (claim 32) which overlaps the amount of 1 to 10 wt % recited in the present claims.

Based on these amounts, is it noted that:

- iv. The combination of F1+F2 is 1.1 to 40 wt % of the composition, which overlaps the amount of at least 13 wt. %.
- v. The combination of F1+F2+F3 is 6.1 to 45 wt % of the composition.

It is noted that both the amounts overlaps the amount of at least 13 wt % of F1+F2 and 14 to 35 wt. % of F1+F2+F3, respectively, recited in the present claims.

Regarding the amount of F1, F2, and F3 as well as combination F1+F2+F3 and F1+F2 disclosed by the reference, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339,

1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); In re Peterson, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); In re Woodruff, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); In re Malagari, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 20, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that R_1 and R_2 are C_{1-6} linear alkyl which encompasses the compounds, dimethylphosphinic acid, ethylmethylphosphinic acid, diethylphosphinic acid and meth(n-propyl) phosphinic acid recited in the present claims.

Regarding claim 21, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that compound F2 is melamine polyphosphate.

Regarding claims 22, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that compound F3 is melam, melon and melam.

Regarding claims 23-24, Hoerold et al teaches all the claim limitations as set forth above. Additionally, the reference discloses thermoplastic polymers such polyester and vinyl polymers, i.e. styrene/butadiene polymers can be utilized in combination with the polyamide polymer (Page 3 [0056]).

Regarding claim 25, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, able 3 of the reference discloses the use of polyamide 6,6.

Regarding claims 26-27, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses the use of glass fibers, denoted as “GR” in Table 3 on Page 6 of the reference. Additionally, the reference discloses the use inorganic fillers such as silica (Page 2 [0040]).

Regarding claims 28-29, Hoerold et al teaches all the claim limitations as set forth above. Additionally, the reference discloses that the composition comprises other flame retardants such as zinc borate, aluminum phosphate and aluminum hydroxide (Page 3 [0040]). Although the reference does not disclose that these compounds as synergists with the flame retardant system, given that the reference discloses the identical flame retardant system recited in the present claims, and given that the reference discloses the identical compound which are considered to the synergists, it is clear that these compounds will inherently function as synergists of the flame retardant system as presently claimed.

Regarding claim 30, Hoerold et al teaches all the claim limitations as set forth above. Additionally the reference discloses blending the compounds F1-F3 with a thermoplastic resin (Page 4 [0086]).

Regarding claim 31, Hoerold et al teaches all the claim limitations as set forth above. Additionally, the reference discloses articles of manufacture, i.e. moldings, filaments, fibers, etc (Page 4 [0088]).

Regarding claim 32, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that the combination of F1 and F2 comprise 7 to 25 wt. % of the composition, which overlaps the amount of at least 15 wt % recited in the present claims. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 33, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that F3 comprising 1 to 10 wt % of the composition which overlaps the amount of 1 to 7 wt % recited in the present claims. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 34, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that F3 comprising 1 to 10 wt % of the composition which overlaps the amount of 1 to 5 wt % recited in the present claims. It is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 35, Regarding claim 33, Hoerold et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses the use of polyamide 6,6 which is a polyamide and is encompassed by the term (co)polyamide recited in the present claims.

9. Claims 15, 20, 25-26, and 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bauer et al (US 2005/0032958).

Regarding claim 15, Bauer et al discloses a composition comprising polyamide, and a combination of flame retardants (Page1, [0005]-[0015], Page [0018]-[0023], Page 2 [0047]). The flame retardant combination or flame retardant system comprises phosphinate given by Formula I of the reference, where the groups R_1 and R_2 are identical or different and are C_{1-5} alkyl linear or branched and/or aryl, m is 2 or 3 (recited as z in the present claims), and M is magnesium

calcium aluminum or zinc (Page 1 [0005]-[0013]). It is noted that the phosphinate disclosed by the reference encompass the compound F1 given by Formula (I) of the present claims.

Further flame retardant (disclosed as B) includes combinations of the flame retardants, i.e. a combination of compounds disclosed as B1, B2, and B3 (Page 1 [0014]). These flame retardants include melamine polyphosphate, i.e., a reaction product between phosphoric acid and melamine (Page [0095]-[0095]). It is noted that this compound (B2 of the reference) is encompassed by compound F2 recited in the present claims.

Further compounds include melam, melem, and melon, i.e. melamine condensation products which form a salt with polyphosphoric acid (disclosed as compound B1 - Page [0015]-[0018]). From this disclosure, it is clear that reference discloses the use of a melamine condensation derivative as presently claimed and therefore corresponds on compound F3 recited in the present claims.

With respect to the amounts of F1, F2, and F3 the following is noted:

i. Attention is directed to Table 1, Inventive Example 6 on Page 5 of the reference which discloses the use of 10 wt % DEPAL, i.e. an aluminum salt of diethylphosphinic acid. It is noted that this compound corresponds to compound F1 of the present claims and the disclosed amount, 10 wt. %, is within the range of from 5 to 15 wt %.

ii. The amount of compound F2 (disclosed as B2) in Table 5 is 10 wt. % which corresponds to the upper bound amount of 10 wt. % of F2 recited in the present claims.

Although Inventive Example 6 does not explicitly disclose the use of compound F3, it is noted that this is but one embodiment and as discussed above, the reference discloses the use of combinations of flame retardants, B, i.e. B1-B3. Further it is noted that the flame retardant B is

disclosed as being utilized in the amount from 1 to 30 wt. % (Page 4 [0083]). Therefore, given that the reference recognizes combinations of flame retardants B1+B2 where B1 is for example of a melamine condensation product which form a salt with polyphosphoric acid and given that B2 in Table 1 is utilized in the amount 10 wt %, it is determined that compound B2 which corresponds to F3 is utilized in the amount of 0 to 20 wt %. It is noted that the amount of F3 overlaps the amount of 1 to 10 wt % recited in the present claims.

Based on the amounts discussed above, it is determined that F1+F2 (A+B2) is 20 wt % while the combination of F1+F2+F3 (A+B1+B2) is determined to be 20 to 40 wt % of the composition, which overlaps the range of at least 15 wt % F1+F2 and 14 to 35 wt % of F1+F2+F3 recited in the present claims.

Regarding the amount of F1, F2, and F3 as well as combination F1+F2+F3 and F1+F2 disclosed by the reference, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 20, Bauer et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that R₁ and R₂ are C₁₋₆ linear alkyl which encompasses the compounds, dimethylphosphinic acid, ethylmethylphosphinic acid, diethylphosphinic acid and meth(n-propyl)phosphinic acid recited in the present claims.

Regarding claim 25, Bauer et al teaches all the claim limitations as set forth above. Additionally, the reference discloses polyamide and copolyamides such as nylon 6, 4, 11, etc. (Page 3 [0069]).

Regarding claim 26, Bauer et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses the use of glass fiber (Page 4 [0087], Table 1).

Regarding claim 30, Bauer et al teaches all the claim limitations as set forth above. Additionally, the reference discloses a process of blending the flame retardants (Page 4 [0084]).

Regarding claim 31, Bauer et al teaches all the claim limitations as set forth above. Additionally, the reference discloses article of manufacture made from the composition, i.e. moldings, films, filaments, etc (Page 4 [0088]).

Regarding claim 32, Bauer et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that the combination of F1+F2 (A+B2) is 20 wt % which overlaps the amount of at least 15 wt % recited in the present claims.

Regarding the amount of F1+F2 disclosed by the reference, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In*

re Peterson, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); In re Woodruff, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); In re Malagari, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 33, Bauer et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that compound B2 which corresponds to F3 is utilized in the amount of 0 to 20 wt %. It is noted that the amount of F3 overlaps the amount of 1 to 7wt % recited in the present claims.

Regarding the amount of F3 disclosed by the reference, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See In re Harris, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); In re Peterson, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); In re Woodruff, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); In re Malagari, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 34, Bauer et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses that compound B2 which corresponds to F3 is utilized in the amount of 0 to 20 wt %. It is noted that the amount of F3 overlaps the amount of 1 to 5 wt % recited in the present claims.

Regarding the amount of F3 disclosed by the reference, it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations

within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir. 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claims 35, Bauer et al teaches all the claim limitations as set forth above. As discussed above, the reference discloses (co)polyamides (Page 3 [0069]).

10. Claims 15, 20-26, and 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlosser et al (US 6,255,371) in view of Yakabe et al (US 2002/0151625).

Regarding claims 15, 21-22, and 32, Schlosser et al teaches a fire-retardant composition comprising polyamides and copolyamides such as nylon-6, nylon-4, and nylon-6,6 (Column 5, Lines 47-64 and Column 6, Lines 1-8). Regarding the fire-retardants, the reference discloses phosphinates given by Formula (I) which is identical to Formula (I) (disclosed a component A) recited in claim 1 as F1 (Abstract, Column 1, Lines 50-59). The reference discloses that R^1 and R^2 of disclosed Formula (I) are C_1 - C_6 alkyl and can be the same or different (Column 1, Lines 65-67). The reference discloses that the phosphinate salt is added to the composition in the amount from 3 to 20 wt % (Column 3 Lines 22-25). Furthermore, it is noted that the amount disclosed by the reference is within the recited amount from 1 to 15 wt % of F1 recited in claim 15 (Column 3, Lines 22-25).

The reference discloses that the composition comprises a second fire retardant such as condensation products of melamine and/or reaction products of melamine with phosphoric acid such as melamine polyphosphate and melam polyphosphate (compound F2) (disclosed as component B Column 2, Lines 7-12 and Column 2 Lines 57-60). The disclosed melamine and melam polyphosphate compound disclosed by the reference clearly encompass the compounds recited in claim 21. It is noted that disclosed component B can be either melamine reaction products or melamine phosphate or a combination of the two. It is noted that disclosed compound B can be a mixture of melamine reaction products and melamine phosphate which clearly encompasses compounds F2 and F3 recited in the instant claims. Furthermore, the reference discloses that component B comprises 3 to 20 wt % (Column 3 Lines 22-25).

It is noted that components A and B comprise 6 to 40 wt %, clearly meeting the claim limitation recited in claims 15 and 32 that the composition comprises at least 13 wt % and 15 wt

% of F1 and F2. Furthermore, as the reference discloses that components A (F1) and B (a mixture of F2 and F3) may independently comprise 3 to 20 wt % of the composition, the total amount of components A and B (and therefore compounds F1-F3) is 6 to 40 wt %, meeting the claim limitation that F1-F3 comprises 1 to 50 wt % of the composition.

Schlosser teaches all the claim limitations as set forth above. While the reference discloses the use of mixtures of condensation products of melamine and reaction products of melamine with phosphoric acid, the reference does not disclose amounts of melamine reaction products.

Yakabe et al discloses fire retardants for polyamides comprising melamine polyphosphates utilized in an amount from 10 to 38 wt % of the composition (Abstract, Page 2 [0011], Page 3 [0025]-[0026]). The reference discloses that these compounds offer very high flame-retardation effects when utilized in combination with inorganic reinforcing materials such as glass as well as heat resistance (Page 3 [0026], [0029]). Further it is noted that based on the amount of the compounds F1 (3 to 20 wt %) and F3 (3 to 20 wt %) disclosed by Schlosser and the amounts of melamine polyphosphate (F2) disclosed by Yakabe et al (10 to 38 wt %), the total amount of F1-F3 is determined to be 3 to 78 wt % of the composition, which overlaps the amount of 1 to 50 wt % of F1-F3 recited in claim 15. It is noted that the polyphosphate compounds disclosed by the reference meets the limitations in claim 21 drawn to compounds such as melamine polyphosphate.

With respect to the limitation drawn the amounts of the compounds F1, F2, and F3 comprising 14 to 35 wt % of the composition, it is noted that the combined disclosures of Schlosser and Yakabe et al disclose that the total amount of F1-F3 is 6 to 40 wt % of the

polyamide composition and which overlaps the range of 14 to 35 wt. % recited in the present claims.

Given that Schlosser et al discloses a composition comprising polymers, phosphinate salts, melamine condensation products and reaction products of melamine and phosphoric acid, as well as inorganic fillers and given that the reference does not explicitly prohibit other ingredients, in light of the particular advantages provided by the use and control of the melamine polyphosphate as taught by Yakabe et al, it would therefore have been obvious to one of ordinary skill in the art to include such compounds in the composition disclosed by Schlosser et al with a reasonable expectation of success.

Regarding claim 20, the combined disclosures of Schlosser and Yakabe et al teach all the claim limitations as set forth above. Although Schlosser does not explicitly disclose the phosphinic acid compounds recited in claim 20, disclosed Formula (I) comprising groups R1 and R2 which may be identical or different and are C₁₋₆ alkyl clearly encompasses the recited compounds in the present claim.

Regarding claims 23-25, the combined disclosures of Schlosser and Yakabe et al teach all the claim limitations as set forth above. As discussed above, Schlosser discloses a composition where polymer is a polyamides or copolyamides such as nylon-6, nylon-4, and nylon-6,6 as well as mixtures of these polymers with PPO, i.e. poly(p-phenylene oxide) (Column 5, Lines 47-64 and Column 6, Lines 1-8).

Regarding claims 26 and 31, the combined disclosures of Schlosser and Yakabe et al teach all the claim limitations as set forth above. Additionally, Schlosser discloses that the composition comprises fillers such as glass fibers as well as articles of manufacture such as moldings, films, filaments and fibers, meeting the claim limitations recited in claim 26.

Regarding claim 30, the combined disclosures of Schlosser and Yakabe et al teach all the claim limitations as set forth above. Additionally, Schlosser discloses a process of blending the thermoplastic polymers with the flamed retardant system (Column 7, Lines 5-19).

Regarding claim 33, the combined disclosures of Schlosser and Yakabe et al teach all the claim limitations as set forth above. As discussed above Schlosser discloses that the compound F3 comprises 3 to 20 wt % of the composition.

Regarding the amount of F3 disclosed by Schlosser it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 34, the combined disclosures of Schlosser and Yakabe et al teach all the claim limitations as set forth above. As discussed above Schlosser discloses that the compound F3 comprises 3 to 20 wt % of the composition.

Regarding the amount of F3 disclosed by Schlosser it is well settled that where the prior art describes the components of a claimed compound or compositions in concentrations within or overlapping the claimed concentrations a prima facie case of obviousness is established. See *In re Harris*, 409 F.3d 1339, 1343, 74 USPQ2d 1951, 1953 (Fed. Cir 2005); *In re Peterson*, 315 F.3d 1325, 1329, 65 USPQ 2d 1379, 1382 (Fed. Cir. 1997); *In re Woodruff*, 919 F.2d 1575, 1578 16 USPQ2d 1934, 1936-37 (CCPA 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974).

Regarding claim 35, the combined disclosures of Schlosser and Yakabe et al teach all the claim limitations as set forth above. As discussed above, Schlosser discloses polyamides and copolyamides (Column 5, Lines 47-64 and Column 6, Lines 1-8)

11. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schlosser et al (US 6,255,371) and Yakabe et al (US 2002/0151625) as applied to claims 15, 20-26, and 30-35 above, and in view of Hanabusa et al (US 6,433,045).

The discussion with respect to Schlosser and Yakabe et al as set forth in Paragraph 10 above is incorporated here by reference.

Regarding claim 27, the combined disclosures of Schlosser and Yakabe et al teach all the claim limitations as set forth above. Additionally, Schlosser teaches that minerals such as chalk may be added to the fire retardant molding composition (Column 7, Lines 20-23). However, the reference does not teach a composition, wherein the reinforcing fillers are wollastonite, kaolin, clay, silica and mica.

Hanabusa et al teaches a fire retardant composition comprising inorganic fillers are wollastonite, kaolin, clay, silica and mica (Column 5, Lines 40-49). Furthermore, the reference teaches that inorganic fillers can be used either singly or in combination of two or more of them. The fibrous filler, particularly the combination of a glass fiber with a powdery and/or platy filler (such as mica, See Column 5, Lines 48-49), is desirable for obtaining excellent mechanical strength.

Given that both Schlosser et al and Hanabusa et al are drawn to flame retardant thermoplastic compositions comprising phosphoric acid salts (Formula F1 of instant application), melamine compounds, and inorganic fillers and fibers, and, given that Schlosser et al does not explicitly prohibit other ingredients, in light of the particular advantages provided by the use and control of the amount of inorganic fillers as taught by Hanabusa et al, it would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to include such inorganic fillers in the flame retardant thermoplastic composition as taught by Schlosser with a reasonable expectation of success.

12. Claims 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlosser et al (US 6,255,371) and Yakabe et al (US 2002/0151625) as applied to claims 15, 20-26, and 30-

35 above, and in view of Lewis (see pages of *Hawley's Condensed Chemical Dictionary* attached to previous Office Action) and Pitts et al (US 3,865,760).

The discussion with respect to Schlosser et al and Yakabe et al as set forth in Paragraph 10 above is incorporated here by reference.

Regarding claims 28-29, the combined disclosures of Schlosser et al and Yakabe teach all the claim limitations as set forth above. Additionally, Schlosser discloses that the compositions may comprise compounds such as chalk (Column 7, Lines 13-19). As evidenced by Lewis chalk is commonly known in the art as calcium carbonate which meets the limitations drawn to alkaline earth metal carbonate recited in the claim 29. While the references do not disclose that calcium carbonate is a flame retardant synergist, it is the Examiner's position that calcium carbonate will inherently function as a synergist. Evidence to support the Examiner's position is found in Col. 1, Lines of 57-61 of Pitts which discloses that calcium carbonate is a flame retardant. Thus, given that the Schlosser discloses a compositions comprising the flame retardants discussed above and given the evidence in Pitts, it is clear that chalk as disclosed in Schlosser will function as a flame retardant synergist as presently claimed.

Response to Arguments

13. Applicant's arguments filed 1/20/2012 have been fully considered but they are not persuasive.

14. Applicants argue that one of ordinary skill in the art would recognize that Schlosser does not teach that compound B is a mixture of (1) condensation products of melamine and (2) reaction products of melamine with phosphoric acid and/or reaction products of condensation products of melamine with phosphoric acid or a mixture of these. As evidence of their position Applicants point to Col 3 Lines 18-29 of Schlosser. However, Applicants' argument is not understood given the disclosure in Col. 2 Lines 7-10 of Schlosser which discloses that component B is a condensation products of melamine and/or reaction products of melamine with phosphoric acid and/or reaction products of condensation products of melamine with phosphoric acid and/or comprising a mixture of these. That is, the reference in this section discloses the following:

[[condensation products of melamine]] and/or [[reaction products of melamine with phosphoric acid]] and/or [[reaction products of condensation products of melamine with phosphoric acid]] and/or [[comprising a mixture of these]]

From this disclosure it is clear, given that all terms in parenthesis (emphasis added) are separated by "and/or" and given that the reference explicitly discloses the phrase "a mixtures of these" that the reference recognizes a number of possible combination of flame retardants including the combination presently claimed. That is, the reference explicitly discloses that B is a mixture of different compound based on melamine, melamine condensation products, as well as products obtained by reacting either of the afore mentioned compounds with phosphoric acid. That is, given that the reference discloses the compound A (phosphinate compound) which encompass compound F1 of the present claims, while mixture B comprises *[[condensation products of melamine]]* i.e., compound F3 recited in the present claims while *[[reaction products*

of melamine with phosphoric acid]] and/or [[reaction products of condensation products of melamine with phosphoric acid]] corresponds to compound F2 of the present claims. In light of the above, it is clear that the reference discloses that B encompasses a mixture of compounds including those presently claimed.

Further, although Col. 2 Lines 54-57 of Schlosser disclose that only melamine and/or condensation products of melamine, both obtained via a reaction with phosphoric acid, it is significant to note that the reference discloses that this is a preferred combination of compounds. To this end, it is noted that “non-preferred disclosures can be used. A non-preferred portion of a reference disclosure is just as significant as the preferred portion in assessing the patentability of claims.” In re Nehrenberg, 280 F.2d 161, 126 USPQ 383 (CCPA 1960).

15. Applicants argue that one of ordinary skill in the art, upon reading Schlosser and Yakabe would not be motivated to use compounds F2 and F3 as required in the instant claims given that Schlosser does not disclose mixtures of compounds F2 and F3. However, as discussed above, it is respectfully submitted that the primary reference Schlosser discloses combinations of F2 and F3. Further, it is noted given that Schlosser does in fact disclose combinations of compounds F2 and F3 and given that Yakabe et al discloses that melamine polyphosphates which offer very high flame-retardation effects when utilized in combination with inorganic reinforcing materials such as glass as well as heat resistance. In light of the above, the Examiner's position remains given that Schlosser et al discloses a composition comprising polymers, phosphinate salts, melamine condensation products and reaction products of melamine and phosphoric acid, as well as inorganic fillers and given that the reference does not explicitly prohibit other ingredients, in

light of the particular advantages provided by the use and control of the melamine polyphosphate as taught by Yakabe et al, it would therefore have been obvious to one of ordinary skill in the art to include such compounds in the composition disclosed by Schlosser et al with a reasonable expectation of success.

16. Applicants argue that Schlosser and Yakabe teach away from utilizing the combination of compounds F1+F2+F3. However, as discussed above, given that Schlosser discloses the use of compounds F1-F3 and given that Yakabe disclosed the benefits utilizing melamine polyphosphates in combination with glass fiber reinforcing fillers, it is the Examiner's position that the references do not teach away from the presently claimed combination of flame retardants but rather provide motivation why one of ordinary skill in the art would utilize the type and amount of flame retardant disclosed by Yakabe in the composition disclosed by Schlosser with a reasonable expectation of success.

17. With respect to Applicants' argument that Schlosser does not disclose a mixture of F2 and F3, as discussed above, Applicants' argument is not understood given that the reference explicitly discloses the combination of F1-F3 as required in the present claims. To that end, it is noted that Yakabe is merely relied upon to teach the use of specific amount of melamine polyphosphates as well as benefits of utilizing this compound with compositions comprising glass fiber.

18. Applicants argue that one of ordinary skill in the art upon reading Yakabe would recognize that the disclosure of Schlosser was available for Yakabe to use, especially in filing a continuation in part application and yet Yakabe (emphasis added) did not disclose the use of F2 and F3. However, firstly it is not the purview of the Office to comment or speculate as to why Yakabe did not comment or utilize the disclosure of Schlosser given that the Schlosser patent issued over a year before Yakabe's continuation-in-part was filed. To this end, it is noted that Applicants' line of argumentation regarding the Yakabe and Schlosser remains unclear. i.e., how the filing and issue dates of the Yakabe and Schlosser references are germane to rebutting the Examiner's *prima facie* case of obviousness. Clarification regarding this issue is respectfully requested.

19. Applicants argue that there cannot be a reasonable expectation of success in obtaining the compositions of the instant claims by modifying the synergistic combination of references. However, it is the Examiner's position, absent evidence to the contrary given that Schlosser recognizes combinations of F1-F3 and given that Yakabe discloses benefits of utilizing melamine polyphosphate, it would have been obvious to one of ordinary skill in the art to modify the composition disclosed by Schlosser with melamine polyphosphate as disclosed by Yakabe with a reasonable expectation of success.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER C. KOLLIAS whose telephone number is (571)-270-3869. The examiner can normally be reached on Monday-Friday, 8:00 AM -5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Basia Ridley can be reached on (571)-272-1453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alexander C Kollias/
Examiner, Art Unit 1725